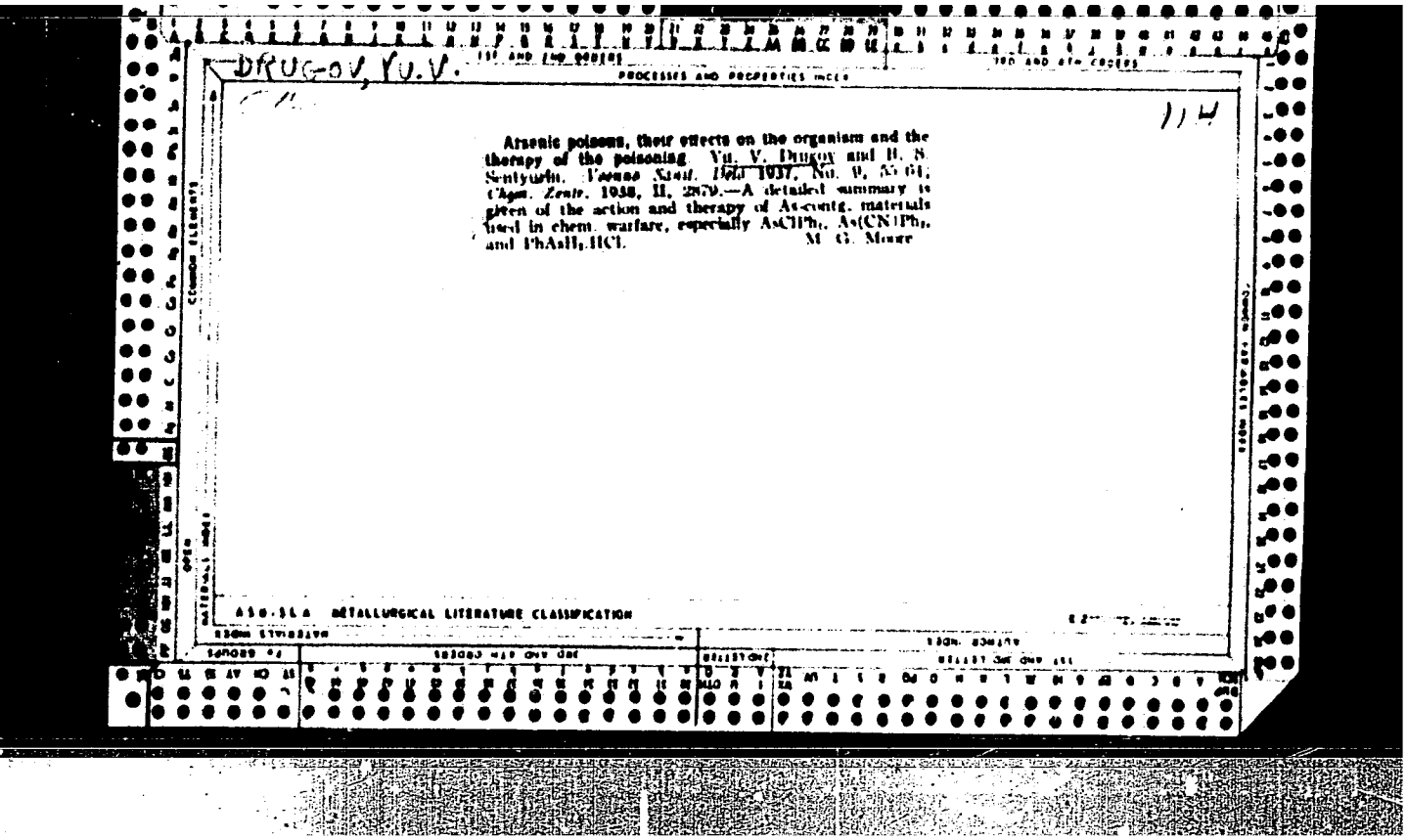


DRUG-OV, YU.V.

114

Arsenic poisons, their effects on the organism and the therapy of the poisoning. Yu. V. Drugov and B. S. Sentyurin. *Voenno Sanit. Delo* 1937, No. 9, 55-61; *Chem. Zentr.* 1938, II, 2879.—A detailed summary is given of the action and therapy of As-contg. materials used in chem. warfare, especially AsClPh_2, As(CN)Ph_2, and $PhAsH_2$.HCl. M. G. Moore

A50-51A METALLURGICAL LITERATURE CLASSIFICATION

ZAKUSOV, V.V., prof.; PONOMAREV, G.A., prof.; DRUGOV, Yu.V.

Plan for the development of research in the field of pharmacology and toxicology during the next seven years; 1959-65. Farm. i toks. 22 no.1:3-6 Ja-F '59. (MIRA 12:4)

1. Deystvitel'nyy chlen AMN SSSR (for Zakusov).
(PHARMACOLOGY,
in Russia, 7-year plan (Rus))

BARYSHNIKOV, K.I.; BRISKIN, A.I.; VOROTYNTSEV, A.P.; GONCHAROV, P.I.; DRUGOV, Yu.V.; LIPSHITS, L.A.; MOKEYEV, N.I.; NAZAROV, A.V.; PETROV, L.P.; SERDIUK, D.S.; SMETANKIN, K.P.; CHERNYAVSKIY, A.A.; ARTEM'IEV, S.G., red.; ZAKHAROVA, A.I., tekhn.red.

[Sanitary and chemical protection; pathology, clinical aspects, and treatment of poisoning. Manual for students and physicians] Sanitarno-khimicheskaia zashchita; patologiia, klinika i terapiia porazhenii otravliaiushchimi veshchestvami. Rukovodstvo dlia studentov i vrachei. Moskva, Gos.izd-vo med.lit-ry, 1959. 434 p. (MIRA 13:6)

(CHEMICAL WARFARE--SAFETY MEASURES)

DRUGOV, YU V

Sanitary Chemical Defense. Washington, U. S., JPRS, 1961.

440 p., Illus., Diagrs., Tables (JPRS: 10049; CSO: 6574-N)

Translation of the Russian Title: Sanitarno-Khimicheskaya Zashchita; Patologiya, Klinika I Terapiya Porazhenii Otravlyayushchimi Veshchestvami, Moscow, 1959.

DRUGOVA, A.A., inzhener.

In the Ministry of the Electric Industry. Vest. elektroprom. 27 no.3:75-76 Mr '56. (MLRA 9:12)

1. Ministerstvo elektropromyshlennosti.
(Electric apparatus and appliances--Standards)

ACC NR: AP5025390 SOURCE CODE: UR/0181/65/007/010/3083/3089

AUTHOR: Bonch-Bruyevich, V. L.; Drugova, A. A.

ORG: none

TITLE: Theory of radiative recombination at impurity centers in homopolar semiconductors

SOURCE: Fizika tverdogo tela, v. 7, no. 10, 1965, 3083-3089

TOPIC TAGS: semiconductor theory, phonon, crystal theory, radiative recombination, recombination radiation

ABSTRACT: The authors calculate the intensity of recombination radiation at small acceptor centers with the participation of phonons. The total intensity of impurity recombination radiation generated by transition of electrons from the conduction band to neutral acceptor levels is given by

$$I=\int f(\nu)\,d\nu.$$

The spectral density $f(\nu)$ is given by the expression

$$f(\nu)=4\pi A\frac{h\nu^3 VN_a^{2/3}}{c^3}\mathcal{P}(\tau).$$

Here N is the total number of acceptor levels in the crystal; V is the fundamental volume; c is the velocity of light in a vacuum; ε is the high frequency dielectric

Card 1/2

L 10579-66
ACC NR: AP5025390

constant of the material; τ is the wave vector of a photon with frequency ν; $\mathcal{P}$ is the probability of radiation of this type of photon (it is shown that this probability depends only on τ^2 within the framework of the proposed model); A is a constant which depends on the conditions of radiation yield in a vacuum ($A \leq 1$; this constant is only slightly dependent on frequency ν far from lattice absorption lines). Probability $\mathcal{P}(\tau)$ is calculated. This is part of the general problem on radiative transitions with the participation of phonons. However, the electron matrix element is usually considered simply as some constant theoretical parameter. In the present case, this element is the main object of study. The investigation is limited to crystals with weak electron-phonon bonds where direct application of perturbation theory is possible. Formulas are derived within the framework of the hydrogen model for the spectral density of recombination radiation as a function of frequency and temperature. The curve for spectral density as a function of frequency shows a maximum. The position of this maximum and the half-width of the curve are determined as functions of temperature. The authors thank Ya. Ye. Pokrovskiy and K. I. Svistunova for discussing the experimental aspects of the work. Orig. art. has: 1 figure, 20 formulas.

SUB CODE: 20/ SUBM DATE: 20Feb65/ ORIG REF: 009/ OTH REF: 007

Card 2/2

DRUGOVA, G.M.; LUR'YE, M.L.; OBRUCHEV, S.V.

Pre-Cambrian of northeastern Tuva. Trudy Lab.geol.dokem. no.5: 255-314 '55. (MLRA 9:1)
(Tuva Autonomous Province--Geology, Stratigraphic)

DRUGOVA, G.M.; KLIMOV, L.V.; KRYLOVA, M.D.; MIKHAYLOV, D.A.; SUDOVIKOV, N.G.; USHAKOVA, Z.G.

Pre-Cambrian geology of the Aldan mining region. Trudy Lab. geol. dokem. no.8:5-331 '59. (MIRA 12:10)
(Aldan Plateau--Geology)

DRUGOVA, G.M.

Granulitic facies of the Aldan Plateau. Trudy Lab.geol dokem. no.9: 265-275 '59. (MIRA 13:11)
(Aldan Plateau--Petrology)

BUZIKOV, I.P.; DRUGOVA, G.M.

Conglomerates in the Archaean system of the Tunkinskiye Gol'tsy (Eastern Sayan Mountains). Trudy Lab.geol. dokem. no.9:374-385 '59. (MIRA 13:11)

(Sayan Mountains--Conglomerate)

DRUGOVA, G.M.; NEYELOV, A.N.

Polymetamorphism of Pre-Cambrian formations in the southern Aldan Shield and Stanovoy Range. Trudy Lab. geol. dokem. no.11:142-216 (MIRA 14:1)

(Aldan Plateau--Metamorphism (Geology))
(Stanovoy Range--Metamorphism (Geology))

DRUGOVA, G.M.

Metamorphism and ultrametamorphism of Lower Archean rocks in the orogenic zone of the Stanovoy Range. Trudy IAFAN SSSR.Ser.Geol. no.11: 40-54 '62. (MIRA 15:7)
(Stanovoy Range region) (Metamorphism (Geology))

SUDOVIKOV, N.G.; DRUGOVA, G.M.; KRYLOVA, M.D.; MIKHAYLOV, D.A.

Tectonic pattern of Archean formations in the Aldan mining region. Izv. AN SSSR. Ser.geol. 27 no.11:95-100 N '62. (MIRA 15:12)

1. Laboratoriya geologii dokembriya AN SSSR, Leningrad.
(Aldan Plateau—Geology, Structural)

DRUGOVA, G.M.; BUGROVA, V.D.

Garnets of granulitic facies in the Aldan Shield and the conditions governing polymetamorphism. Zap. Vses. min. ob-va 93 no.1:37-45 '64 (MIRA 18:2)

1. Laboratoriya geologii dokembriya, Leningrad.

SUDOVIKOV, Nikolay Georgiyevich, doktor geol.-miner. nauk; GLEBOVITSKIY, Viktor Andreyevich; DRUGOVA, Galina Mikhaylovna; KNYLOVA, Melitina Dmitriyevna; NEYELOV, Aleksandr Nikolayevich; SEDOVA, Irina Sergeyevna;

[Geology and petrology of the southern margin of the Aldan Shield] Geologiia i petrologiia iuzhnogo obramleniia Aldanskogo shchita. [By] N.G.Sudovikov i dr. Moskva, Nauka, 1965. 289 p. (MIRA 18:3)

5(4), 15(9) SOV/76-33-4-7/32

AUTHORS: Slonimskiy, G. L., Drugova, G. P.

TITLE: On Mechano-chemical Phenomena in Polymers (O mekhano-khimicheskikh yavleniyakh v polimerakh). III. Bond Strength Between the Elements of Multilayer Polymer Articles (III. Prochnost' vzaimnoy svyazi elementov mnogosloynykh polimernykh izdeliy)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 4, pp 793-798 (USSR)

ABSTRACT: The low resistivity of multilayer rubber articles is frequently not due to the normal wear of the rubber but to a loosening of the individual layers or of the rubber covering from the textile basis. This destruction due to mechanical stress takes place at the junctions. It was demonstrated already (Refs 2-4) that the chain molecules of the polymers are destructed under the formation of free radicals due to the deformation stress. Thus secondary chemical processes take place which lead to the destruction of the article. For this reason an increase of the resistivity of multilayer rubber articles (rubber tires) should be obtained by substances which exercise an inhibiting effect on such secondary processes and the

Card 1/3

On Mechano-chemical Phenomena in Polymers. III. Bond Strength Between the Elements of Multilayer Polymer Articles

processes which take place on the junction surfaces should be observed. Layer materials of normal (SKS-30 A) and oil-(SKS-30-AM)-butadiene-styrene-rubber which were glued by means of an adhesive (on a natural rubber basis) with or without inhibitor addition were investigated. Polyethylene polyamine (I), 2,5-di-tert-butyl hydroquinone (II), dinaphthyl disulphide (III), tri-tert-butylphenol (IV), benzoquinone (V), acetanil (VI), hydroquinone (VII) were investigated in different amounts of addition. The investigation of the dynamic loosening of the layers was carried out on the De-Matti machine. It was found that e.g. additions of three parts by weight of (I) to 100 parts by weight of natural rubber adhesive increase the adhesive power of the samples on an SKS-30A and also SKS-30AM basis (Fig 1) by the 10-fold. The amount of addition to the inhibitor, however, is important because an optimum addition was observed, and on the other hand, a relation between the effect of the inhibitor and the time of rolling of the rubber may be observed (Fig 2). The experimental results obtained in the case of agglutinations with (II)-additions (Table) as well as explanations on the mechano-chemical process in the

SOV/76-33-4-7/32

On Mechano-chemical Phenomena in Polymers. III. Bond Strength Between the Elements of Multilayer Polymer Articles

separation of the layer are tabulated (Table). There are 2 figures, 1 table, and 10 Soviet references.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti Moskva
(Scientific Research Institute of the Tire Industry Moscow)

SUBMITTED: August 8, 1957

Card 3/3

DRUGOVA, L.

Surmounting the difficulties. Okhr. truda i sots. strakh. 4 no. 2:39-40 F '61. (MIRA 14:2)

1. Doverennyy vrach Belgorodskogo oblsovprofa.
(Belgorod Province—Iron mines and mining—Hygienic aspects)

1. DRUGOVA, K., KLIMCHUKOV, S., Eng.

2. USSR (600)

4. Lumbering - Machinery

7. Repairing machinery at the Verkhne-Lup'inskii lumbering camp. Les prom No. 2 1953.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

S/138/60/000/012/008/009
A051/A027

AUTHORS: Tsvetayeva, Ye. M., Sidorova, R.I., Drugovskaya, M.N., Shokhin, I.A.

TITLE: Synthetic Softeners for the Reclaiming of Rubber Produced From the Products of Its Pyrolysis

PERIODICAL: Kauchuk i rezina, 1960, 19 No.12, pp. 31-34

TEXT: The authors have developed a method for the production of a polymer from rubber oil, which can serve as an active softener in rubber reclaiming. The method also helps to deodorize the rubber oil. Mention is made of the method presently used in the USSR for the production of rubber oil, containing 90% of compounds, which react with strong H_2SO_4 (Ref.2) (Fig. 1). The medium and heavy fractions of the oil contain more of these compounds than the light ones. Since the oil contains 80% of medium and heavy fractions with the greater unsaturation, this product can be processed without preliminary fractionating. The method developed by the authors is described as follows: 98% H_2SO_4 (12 w.p.) is poured into an apparatus

Card 1 / 6

S/138/60/000/012/008/009
A051/A027

Synthetic Softeners for the Reclaiming of Rubber Produced From the Products of Its Pyrolysis

equipped with a mixer and a jacket, in which the rubber oil (100 w.p.) is vigorously mixed for 20-30 min, at a temperature of 10-25°C in small portions. Then the mixing continues for 2-3 hours more at the same temperature. After holding 4-5 hours the acidic petroleum asphalt is let out of the apparatus and the remaining oil is processed a second time with H_2SO_4 (10 w.p. based on the initial oil). The second asphalt let out after holding of 16-20 hours is mixed with the first one. The purified oil is washed with hot water 3-4 times and is neutralized with a 0.5% solution of NaOH at 60-70°C. Then a second washing with water is done. Due to this processing an oil is produced with an odor of kerosene. The water is separated from the oil by heating for 2-3 hours at 80-95°C. The formed acidic asphalt is washed 4-5 times with hot water and is then neutralized with a 10% solution of NaOH at 60-70°C, whereby the alkali solution is introduced in 4-5 portions. Each portion is about one quarter of the asphalt volume. The reaction of the last rinsing water should be neutral or weakly acidic. The obtained organic

Card 2/6

S/138/60/000/012/008/009
A051/A027

Synthetic Softeners for the Reclaiming of Rubber Produced From the Products of Its Pyrolysis.

mass (subsequently called polymer) contains up to 40% of emulsion water, the main quantity of which can be separated after heating for 3-4 hours at 90-95°C. In order to produce a well-deodorized polymer, it is suggested distilling the volatile components at 130-140°C. The described method can be recommended for industrial use. The polymer yield was 46% and the deodorized oil 43% of the initial oil. The deodorized oil as compared to the non-processed one has a lower iodine number and contains less sulfur. The increase in the molecular weight, viscosity, specific gravity and relative content of heavy fractions when processed with sulfuric acid points to the fact that the deodorized oil contains also polymers in addition to unchanged components of the non-processed oil. The latter differ from polymers passed into the asphalt by lesser polarity and unsaturation. A conclusion is drawn that when processing rubber oil with sulfuric acid together with other processes dehydro- and hydropolymerization take place (Ref.3). It was also seen that the deodorized oil contrary to the initial oil contains sulfur in the form of odorless compounds. When heated under atmospheric

Card 3/ 6

S/138/60/000/012/008/009
A051/A027

Synthetic Softeners for the Reclaiming of Rubber Produced From the Products of Its Pyrolysis

pressure, these sulfur compounds begin to decompose at a temperature of 150°C forming substances with an unpleasant odor. When heating the oil mixture with rubber and rubber chunks even at 190°C no odor is noted. The polymer obtained from the asphalt is found to contain more hetero-atoms (especially sulfur and oxygen) than the non-processed and deodorized oil. In the deodorizing process the quantity of oxygen in the oil even increases somewhat. It is concluded that the increase in the quantity of the hetero--atoms in the polymer can take place as a result of the extraction of compounds with hetero-atoms from the oil with sulfuric acid and the formation of new polar compounds by sulfurization of certain components of the oil. Due to a lower iodine number the deodorized oil differs from the non-processed oil by a lowered masticating action. Both oils do not have sufficient intensifying action due to a low content of polar compounds in them (Ref.4). It is pointed out, therefore, that these oils can be used in rubber reclaiming only in combination with more polar softeners. The polymer is said to

Card 4/ 6

Synthetic Softeners for the Reclaiming of Rubber Produced From the Products of Its Pyrolysis

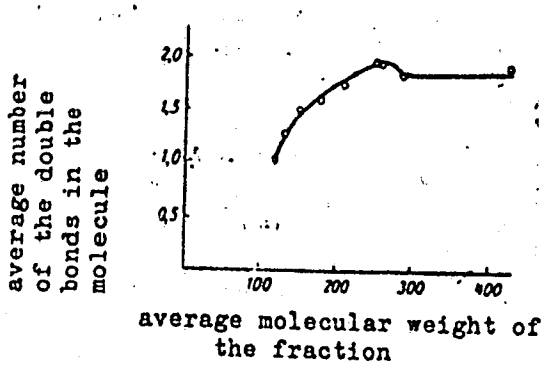
be a very active reclaiming agent, easily used without any addition of other softeners. The reclaimed rubber thus obtained has good physico-mechanical indices and an elevated chloroform extract. It also has a lowered acetone extract. The polymer samples and the deodorized oil were tested at the Chekhovskiy regeneratnyy zavod (Chekhov Reclaiming Plant) under semiindustrial conditions in reclaiming tire rubber by the water-neutral method. The results corresponded well with laboratory findings. It is pointed out that the deodorized rubber oil is not recommended as a universal softener, as it is applicable only to the reclamation of rubber not requiring very large amounts of softener. An estimation of the cost showed that the polymer would be twice as low in cost (1,000 rubles/ton) as the applied combined softener in most plants based on Arkhangel'sk pine resin and fuel oil. There are 5 tables and 4 Soviet references.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti i Chekhovskiy regeneratornyy zavod (Scientific Research Institute of the Tire Industry and Chekhov Reclaiming Plant).

S/138/60/000/012/008/009
A051/A027

Synthetic Softeners for the Reclaiming of Rubber Produced From the Products of Its Pyrolysis

Fig. 1 Relationship between the unsaturation of the rubber oil fraction and the molecular weight.



Card 6/6

DRUGOVSKAYA, M.N.

S/138/62/000/001/007/009
A051/A126

AUTHORS: Krivunchenko, N.G.; Kolkhir, K.F.; Zvereva, N.I.; Dmitriyeva, Ye.V.; Drugovskaya, M.N.; Sokolov, S.A.

TITLE: The use of gas-producing resins in rubber reclaiming

PERIODICAL: Kauchuk i rezina, no. 1, 1962, 52 - 53

TEXT: The disadvantages of dry-distillation of pine tars, for use as softeners in rubber reclaiming are non-uniformity and high cost. In the attempt to find new resins for this purpose, gas-producing ones proved to be the most successful. The Chekhov Rubber Reclaiming Plant developed the composition of a resin and a technology of rubber reclaiming, using the product of the Izhevsk Plant in 1958. This product has the following advantages: 1) Uniformity in group composition of the softener, leading to improved physico-mechanical properties of the reclaimed rubbers. 2) Reduced production cost of the reclaimed rubber. 3) Increased capacity output of the refining rollers. 4) Increased capacity output of the autoclaves due to a shorter rubber devulcanization process. 5) Improved receiving and storage methods of the resin, eliminating the use of wooden barrels. The Chekhov Recovery Plant produced 6.5 thousand tons of re-

Card 1/2

S/138/62/000/001/007/009
A051/A126

The use of gas-producing resins in rubber reclaiming

claimed rubber in 1959. In 1960, the Recovery Plant consumed 2,000 tons of resin. There is 1 table.

ASSOCIATION: Chekhovskiy regeneratnyy zavod (Chekhov Recovery Plant)

Card 2/2

IZAKSON, Kh.A., podpolkovnik med.sluzhby; DRUI, Ye.Ya., podpolkovnik med.sluzhby

Psychoneurological study of flight crews. Voen.-med. zhur. no. 2:84 F '61. (MIRA 14:2)
(FLIGHT CREWS—PSYCHOLOGICAL ASPECTS)

POLIKANOV, S.M.; DRUIN, A.V.; KARNAUKHOV, V.A.; MIKHEYEV, V.L.; PLEVE, A.A.; SKOBELEV, N.K.; SUBBOTIN, V.G.; TER-AKOP'YAN, G.M.; FOMICHEV, V.A.

[Spontaneous fission with an anomalously short period] Spontannoe delenie s anomal'no korotkim periodom. Dubna, Ob"edinennyi in-t iadernykh issl. Pt.1. 1662. 17 p. (MIRA 15:1)
(Nuclear fission)

DRUIN B.F.

SUBJECT USSR / PHYSICS
AUTHOR GUSEVA,L.I., FILIPPOVA,K.V., GERLIT,V.A., DRUIN,B.F., MYASOEDOV,B.F., TARANTIN,N.I.
CARD 1 / 1 PA - 1720
TITLE Experiments carried out with a Cyclotron on the Occasion of the Production of Einsteinium and Fermium.
PERIODICAL Atomnaja Energija, 1, fasc. 2, 50-54 (1956)
Issued: 1 / 1957

The results obtained by some experiments carried out on the occasion of the production of einsteinium and fermium by bombarding the uranium nuclei with quintuply ionized nitrogen and with sextuply ionized oxygen are described.

The half life and the energy of the α-particles are on this occasion determined by means of a photographic plate, with an ionization chamber which has spherical electrodes, and by means of a twenty-channel counting tube.
A chromatographic method was used for the purpose of separating the transplutonium elements. By the bombardment of radioactive uranium with nitrogen ions of 105 MeV an einsteinium isotope with the mass number 247 was obtained, but by bombarding uranium with oxygen ions of 120 MeV a fermium isotope was obtained.

INSTITUTION:

DRUIN, V. A.

Category : USSR/Nuclear Physics - Structure and Properties of Nuclei C-4

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3216

Author : Guseva, L.I., Filippova, K.V., Gerlit, Yu.B., Druin, V.A., Myasoyedov, B.F., Tarantin, N.I.

Title : Experiments on Obtaining En and Fm with a Cyclotron.

Orig Pub : Atom. energiya, 1956, No 2, 50-54

Abstract : Report of production of transplutonian elements by bombarding U with nuclei of N and O. Quintupli-charged ions of N and sextuple-charged ions of O were accelerated with a cyclotron having a magnet with pole diameters of 150 cm. The transplutonian elements were separated by the fluoride method using La as a carrier. The half lives and the energies of the α particles were measured with the aid of photographic plates and an ionization chamber with a spherical electrode. The quintuple-charged ions of N were obtained in a specially developed slit-type source. The energy of the N ions at the maximum radius was 105 Mev, and the ion current was 5×10^{-7} amp. Irradiation of U by N ions produced the isotope En^{247}, identified by the value of T and by the energy of the α particles. Sextuple-charged O ions were obtained by "stripping" double-charged O ions on molecules of the residual gas in the cyclotron

Card : 1/2

chamber. The maximum energy of the accelerated sextuple-charged ions of O at the maximum radius was 120 Mev. The current of ions with energies exceeding 100 Mev was 3×10^{-9} amp. The isotope Fm was obtained by exposing U to ions of O and was identified by the value of T and by the energy of the α particles. Several hundreds of atoms each of isotopes of Cf, Bk, and Cm were separated by the chromatographic method.

DRUIN, V. A., BARABOSHKIN, S. A., FLEROV, G. N., HARUTYAN, A. S., AND POLIKANOV, S. M.

(Acad. Sci. USSR)

"Interaction between Nitrogen Nuclei and

DRUIN, V.A.

AUTHOR DRUIN, V.A., POLIKANOV, S.M., FLEROV, G.N. [redacted]

TITLE Nuclear Fission Induced by Accelerated Nitrogen Ions. 56-6-5/56
(Deleniye yader pod deystviyem uskorennykh ionov azota -Russian)

PERIODICAL Zhurnal Eksperim.i Teoret.Fiziki,1957,Vol 32,Nr 6,pp 1298-1304
(U.S.S.R.)

ABSTRACT The introduction contains a short report on the stage to which the problem has hitherto developed.The present paper deals with the determination of the fission cross section of U^{235},U^{238},Bi,Au,Re and Yb under the influence of accelerated nitrogen ions in dependence on the energy of the nitrogen nuclei.

Experimental technology: The nitrogen ions were accelerated by means of a cyclotron with a pole diameter of 150 cm.The fission fragments were observed by means of an ionization chamber.Also the recording of nitrogen ions and the experiments on the exterior bundle are discussed.The targets consisted of aluminum disks of 14 μ thickness upon which the layers of the substance to be investigated are applied.

Experimental results:The here obtained data concerning the fission cross sections of U^{235},U^{238},Bi,Au,Re and Yb at different energies of the nitrogen nuclei are illustrated in form of diagrams.Also the statistical measuring errors are shown in these diagrams.

Discussion of results: When analyzing their experimental results, the authors based upon the fact that before the process of fissioning a highly excited nucleus with known values of the excitation energy and of the parameter Z^2/A are formed.Experimental investi-

Card 1/2

Nuclear Fission Induced by Accelerated Nitrogen Ions. [redacted] 56-6-5/56

gations of the interaction between the accelerated nitrogen ions and U^{235} and U^{238} nuclei showed that the products of those reactions at which there is no fission are created with a probability that is considerably lower (by about 100 times) than fission.The data obtained here make it possible to estimate the upper limit of the fission cross section of the uranium nuclei in consideration of their Coulomb excitation on the occasion of interaction with the accelerated nitrogen ions.Several special results are then dealt with.
(5 illustrations)

ASSOCIATION Not Given.
PRESENTED BY
SUBMITTED 12.1.1957
AVAILABLE Library of Congress.
Card 2/2

FLEROV, G. N., POLIKANOV, S. M., KARAMYAN, A. S., PASYUK, A. S., PARFANOVICH, D. M., TARANTIN, N. I., KARNAUKHOV, V. A., DRUIN, V. A., VOLKOV, V. V., SEMCHINOVA, A. M. OGANESYAN, Yu. Ts., KHALIZEV, V. I., and KHLEBNIKOV, G. I.

"Experiments to Obtain Element 102." Dokl. Akad. SSSR, Vol. 120, No. 1, 73-5 (1958). In Russian.

Plutonium isotopes Pu^{239} and Pu^{241} were irradiated with oxygen ions, accelerated to 102 MeV. The nucleus so produced leaves the target, because of recoil and is picked up in a collector. This can be moved, in a time of 4-5 sec. over to nuclear emulsions which are designed to register a-particles. Alpha-particles of energy greater than 8.5 MeV are detected. These could come from $Pu^{239,241}$,(O^{16} ,4-6n) $102^{251,253}$. The total number of a-particles with an energy exceeding 8.5 MeV (those of energy less than 7 MeV could come from platinum contamination) was 18 in the irradiation of Pu and 8 in the case of Pu^{239}. These figures would given cross-sections for formation of element 102 of 2×10^{-34} and 5×10^{-33} cm^2, respectively.

5(0)

AUTHOR: Druin, V.

SOV/89-6-6-18/27

TITLE: On the Discovery of the Element 102 (Ob otkrytii elementa 102)

PERIODICAL: Atomnaya energiya, 1959, Vol 6, Nr 6, pp 678-679 (USSR)

ABSTRACT: On the occasion of the 8th Mendeleyev Congress on General and Applied Chemistry (Moscow, March 1959) the Corresponding Member AS USSR, G. N. Flerov and Professor A. Giorso (USA) spoke on the synthesis of the element 102 (discovered in 1957 by a group of scientists of the USA, Great Britain, and Sweden in Stockholm, bombardment of Cm^{244} by C^{13}-ions, 102^{253}, α-active, E_α = 8.5 Mev, half life 10-15 min). G. N. Flerov reported on work concerning the synthesis of this element carried out in the USSR. A collective of physicists and chemists of the Institut atomnoy energii AN SSSR (Institute of Nuclear Energy AS USSR), of the Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Researches) and the Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy) worked in this field. In 1957 the first success was

Card 1/2

On the Discovery of the Element 102

achieved; the element 102 was produced by bombardment of Pu^{241} nuclei with O^{16}-ions accelerated in the cyclotron, the α-energy was determined to be $\sim$8.8 Mev, the half life was between some seconds and one minute, the atomic weight 253. (Berkeley: E_α 8.3 Mev, $T_{1/2}$ $\sim$3 sec, A = 254). The results concerning the half life are in contradiction with those found in Stockholm; investigations carried out in 1959, however, showed that the element 102^{253} has the half life of $\sim$15 sec and E_α $\sim$8.8 Mev which agrees with the data found by Flerov.

21(7)

AUTHORS: Polikanov, S. M., Druin, V. A. SOV/56-36-3-14/71

TITLE: The Nuclear Fission of Heavy Elements in Interaction With Carbon-Nitrogen- and Oxygen Nuclei (Deleniye yader tyazhelykh elementov pri vzaimodeystvii s yadrami ugleroda, azota i kisloroda)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 3, pp 744-747 (USSR)

ABSTRACT: In the interaction between multicharged ions and nuclei of heavy elements a compound nucleus excited to several 10 Mev is formed, which decays either by fission or by neutron evaporation. The ratio between these two processes depends on charge, mass, and excitation energy of the compound nucleus. The authors carried out a number of experiments for the purpose of determining the fission cross section by irradiating various elements with multicharged ions. The investigations were carried out both in the internal chamber of the 150 cm cyclotron and also at a distance of 12 m from the cyclotron (ionization chamber). Irradiation was carried out with C^{12}-, N^{14}- and O^{16} ions. The energy of these ions was determined

Card 1/3

by their absorption in aluminum (conclusion drawn from range to energy). Uranium, bismuth, gold, and rhenium was at first used as target material. Measuring results are shown (Figs 1-3) in form of diagrams. Figure 1 shows the dependence of the fission cross sections σ_f for Bi and U^{238}, both the experimental and the theoretical curve being plotted. It is according to the formula

$$\sigma = \pi r_o^2 (A_{target}^{1/3} + A_{particle}^{1/3})^2 (1 - B/E)$$

with $r_o = (1.4 + 1.55).10^{-13}$cm if the energy of the bombarding particles E is greater than the Coulomb (Kulon) barrier B. Figure 3 shows the dependence of the σ_f of Bi, Au, Re and Yb on the energy of the N^{14}-ions. These curves show the high degree of dependence of the σ_f-value on Z^2/A of the compound nucleus in the case of a given excitation energy. Further investigations concern angular distribution. Recordings were made of the emission of fission fragments at 90 and 135° with respect to the incident ion beam. For the ratio between the activity of the foil and 135° and the activity of the foil at 90° the following was obtained: 1.18±0.06 for uranium and

1.48±0.06 for gold. The fragments emerging from a layer having a thickness equal to the fragment range were recorded on this occasion. In consideration of the somewhat higher efficacy of fragment recording at 135°, $J(135^\circ)/J(90^\circ)$ is found to amount to 1.05±0.10 for uranium and to 1.21±0.10 for gold. By conversion for the c.m.s. $J(141^\circ)/J(99^\circ) = 1.15\pm0.10$ is found for uranium and $J(142^\circ)/J(101^\circ) = 1.36\pm0.13$ for gold. For the ranges of fission fragments the following is obtained (in μ): Angle: 90°, uranium: 11.2±0.8 gold: 10.8±1.0

135° 11.1±0.8 10.1±1.0

The authors finally thank Professor G. N. Flerov for his interest in this work, and Yu. V. Lobanov for his help in carrying out experiments and evaluating results. There are 3 figures, 1 table, and 2 Soviet.references.

SUBMITTED: September 13, 1958

Card 3/3

21(7)

AUTHORS: Druin, V. A., Lobanov, Yu. V., Polikanov, S. M.

SOV/56-37-1-6/64

TITLE: The Angular Distribution of the Fragments in a Nuclear Fission by Heavy Ions (Uglovoye raspredeleniye oskolkov pri delenii yader tyazhelymi ionami)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 1, pp 38-40 (USSR)

ABSTRACT: In the introduction a number of earlier papers is briefly discussed. In nuclear fissions induced by neutrons, protons, α-particles, C^{12}-nuclei, and γ-quanta, an anisotropy in the angular distribution of fragments has already been found to exist. The present paper is a continuation of reference 9, where the authors had investigated the angular distribution in fissions induced by C^{12}-nuclei. Here they report about measurements of the anisotropy of the angular distribution of fragments in fissions of gold- and U^{238}-nuclei induced by C^{12}- and O^{16}-ions. The measurements were carried out on the 150 cm cyclotron of the AS USSR. The maximum ion energies were 78 and 100 Mev for C^{12} and O^{16} respectively. Fragments were recorded by means of a device which is shown in form of a

Card 1/3

schematical drawing by figure 1. The aluminum foils picking up the fragments were arranged at angles of 90 and 135° with respect to the direction of radiation. The results obtained by the experiments are shown by a table. Gold was bombarded with C^{12}-ions of the energies of 66 and 78 Mev and with O^{16}-ions of the energies of 85 and 100 Mev, while U^{238} was bombarded only with C^{12} (78 Mev). The ratio of the yield of fission fragments emitted at 135 and 90° was measured, and so were the ranges of the fission products. Figure 2 shows the dependence of the yield ratio at 141 and 120° on the maximum angular momentum of the compound nucleus. Calculation of curves was carried out according to the formulas deduced by Strutinskiy on the basis of the statistical theory (Ref 2); the experimentally determined anisotropy coefficients only partly agree with the statistical curves. The authors finally thank G. N. Flerov for supervising work, V. M. Strutinskiy and G. A. Pik-Pichak for discussions. It is said in a footnote that the authors Lobanov and Polikanov are collaborators of the Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research).

The Angular Distribution of the Fragments in a Nuclear Fission by Heavy Ions SOV/56-37-1-6/64

There are 2 figures, 1 table, and 10 references, 4 of which are Soviet.

SUBMITTED: February 9, 1959

Card 3/3

DRUIN V. A.

21 (7)

AUTHORS: Mikheyev, V. L., Skobelev, N. K., SOV/56-37-3-45/62
Druin, V. A., Flerov, G. N.

TITLE: On the Spontaneous Fission of Am^{241}

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 3(9), pp 859 - 861 (USSR)

ABSTRACT: A number of heavy odd nuclei showing spontaneous fission has already been investigated by American authors. A short report is given on these investigations in the introduction. In the following, investigations carried out by the authors themselves are described. A gas scintillation counter was used as a detector for the fission fragments. The counter consisted essentially of a hermetically closed chamber filled with xenon, the glass window of which was connected to a photomultiplier; the inside of the window was covered by a layer of quaterphenyl ($\sim$50 $\mu g/cm^2$), which caused ultraviolet radiation to be transformed into visible light. The chamber was evacuated to $5 \cdot 10^{-6}$ Hg and then filled with Xe (2 atm). The FEU-33-type photomultiplier had a time resolution of $\sim 3 \cdot 10^{-9}$ sec. Recording of the

Card 1/3

fission fragments in the case of the strong α-background was carried out by means of a fast discriminator; a DGTs-7 diode served as nonlinear element in the circuit. The entire device was first tested by means of a Pu^{240} target and was calibrated with U^{235}(200 μg). The Pu^{240}-half life was determined as amounting to $1.2 \cdot 10^{11}$ a, which agrees well with other measurements. For the purpose of determining the counting characteristic all counters were surrounded by paraffin, and Po+Be was used as a neutron source (cf. figure). It was found that in the transition from Pu^{240} to Am^{241} the characteristic practically did not change. Measurements on ~60 μg Am^{241} were carried out during 160 hours with a discrimination threshold of 4v. During this time 26 pulses were recorded; as shown by control tests, at least 18 of them originated from the background. Thus, the lower limit of the half-life of the spontaneous fission of Am^{241} is about $2 \cdot 10^{14}$ a. The Cm^{242} impurity is estimated

at 10^{-10}%. In conclusion, the results are compared with those obtained by Segre; the authors thank V. F. Gerasimov for his advice in constructing the counters. There are 1 figure and 6 references, 1 of which is Soviet.

SUBMITTED: May 26, 1959

FLEROV, G.N.; POLIKANOV, S.M.; KARAMYAN, A.S. [deceased]; PASYUK, A.S.; PARFANOVICH, D.M.; TARANTIN, N.I.; KARNAUKHOV, V.A.; DRUIN, V.A.; VOLKOV, V.V.; SEMCHINOVA, A.M.; OGANESYAN, Yu.TS.; KHAIZEV, V.I.; KHLEBNIKOV, G.I.; MYASOYEDOV, B.F.; GAVRILOV, K.A.

Experiments to produce element No. 102. Zhur. eksp. i teor. fiz. 38 no.1:82-94 Jan '60. (MIRA 14:9)

1. Sotrudniki Ob"edinennogo instituta yadernykh issledovaniy (for Polikanov, Oganesyan, Gavrilov). 2. Sotrudnik Instituta geokhimii i analiticheskoy khimii AN SSSR (for Myasoyedov).
(Transuranium elements)

IRUIN, V.A.; MIKHEYEV, V.L.; SKOBELEV, N.K.

Spontaneous fission of Am^{241}. Zhur. eksp. i teor. fiz. 40 no.5:1261-1262 My '61. (MIRA 14:7)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Nuclear fission) (Americium—Isotopes)

DRUIN, V.A.; PERELYGIN, V.P.; KHLEBNIKOV, G.I.

Spontaneous fission periods for Np^{237}, Pu^{238}, and Pu^{242}.
Zhur. eksp. i teor. fiz. 40 no.5:1296-1298 My '61. (MIRA 14:7)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Nuclear fission)
(Neptunium—Isotopes)
(Plutonium—Isotopes)

DRUIN, V.A.

[Energy dependence of the cross section for the production of Md_{101}^{256} in the irradiation of U_{92}^{238} with Ne_{10}^{22} nuclei] Energeticheskaia zavisimost' secheniia obrazovaniia Md_{92}^{256} iadrami Ne_{10}^{22} Dubna. Ob"edinennyi in-t iadernykh issledovanii, 1962.
9 p. (MIRA 15:2)

(Mendelevium) (Nuclear reactions)

BARANOVA, G.; BRANDSHTETR, I.; DRUIN, V.A.; YERMAKOV, V.; ZVAROVA, T.; KRZHIVANEK, M.; MALY, Ya.; POLIKANOV, S.; SU KHUN-GUY [Su Hung-kuei]

[Production of Md^{256} through irradiation of U^{238} with Ne^{22} ions, study of some of its chemical properties] Poluchenie Md^{256} pri obluchenii U^{238} ionami Ne^{22} i izuchenie ego nekotorykh khimicheskikh svoistv. Dubna, Ob"edinennyi in-t iadernykh issl., 1962. 11 p. (MIRA 15:1)

(Mendelevium) (Uranium) (Neon)

DRUIN, V.A.; BRANDSHTETR, I.; MALY, Ya.

[Measurement of the period of spontaneous fission of the fermium isotope Fm^{252}] Izmerenie perioda spontannogo deleniia izotopa fermiia Fm^{252}. Dubna, Ob"edinennyi in-t iadernykh issledovanii, 1962. 12 p. (MIRA 15:2)
(Nuclear fission) (Fermium--Isotopes)

BERANOVA, H.; BRANDSHTETR, I.; DRUIN, V.; YERMAKOV, V.; ZVAROVA, T.; KZHIVANEK, M. (Krzywanek, M.); MALY, Ya. (Maly, J.); POLIKANOV, S.; SU HUNG-KUEI

Synthesis of ^{256}Md as a result of irradiating ^{238}U with ^{22}Ne ions and research on some of its chemical properties. Nukleonika 7 no.7/8:465-471 '62.

1, Ob"yedinennyy institut yadernykh issledovaniy, Dubna, Laboratoriya yadernykh reaktsiy.

DRUIN, V.A.

The cross section of $^{256}_{101}$Md synthesis by irradiation of $^{238}_{92}$U as a function of energy of $^{22}_{10}$Ne ions. Nukleonika 7 no.7/8: 473-478 '62.

1. Ob"yedinennyy institut yadernykh issledovaniy, Dubna, Laboratoriya yadernykh reaktsiy.

38855
S/056/62/042/006/007/047
B104/B102

24 6600 (2806)

AUTHORS: Polikanov, S. M., Druin, V. A., Karnaukhov, V. A., Mikheyev, V. L., Pleve, A. A., Skobelev, N. K., Subbotin, V. G., Ter-Akop'yan, G. M., Fomichev, V. A.

TITLE: Spontaneous fission with an anomalously short period. I

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 6, 1962, 1464 - 1471

TEXT: U^{238} was irradiated by accelerated Ne^{22} and O^{16} ions from the internal beam of the 300 cm cyclotron of the OIYaI. By means of an ionization chamber, spontaneous fission fragments of an unknown isotope having a half life of ~0.02 sec were recorded. The nucleus obtained is assumed to be in an isomeric state with spontaneous fission probability increased (by more than 10^9 times). From experimental data the atomic number is estimated to be ≤ 100. G. N. Flerov, Corresponding Member AS USSR, is thanked for supervising the investigation. There are 5 figures and 1 table.

Card 1/2

Spontaneous fission with an anomalously... S/056/62/042/006/007/047
B104/B102

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: January 24, 1962

Card 2/2

S/089/63/014/001/002/013
B102/B186

AUTHORS: Flerov, G. N., Donets, Ye. D., Druin, V. A.

TITLE: Spontaneous fission and synthesis of far transuranium elements

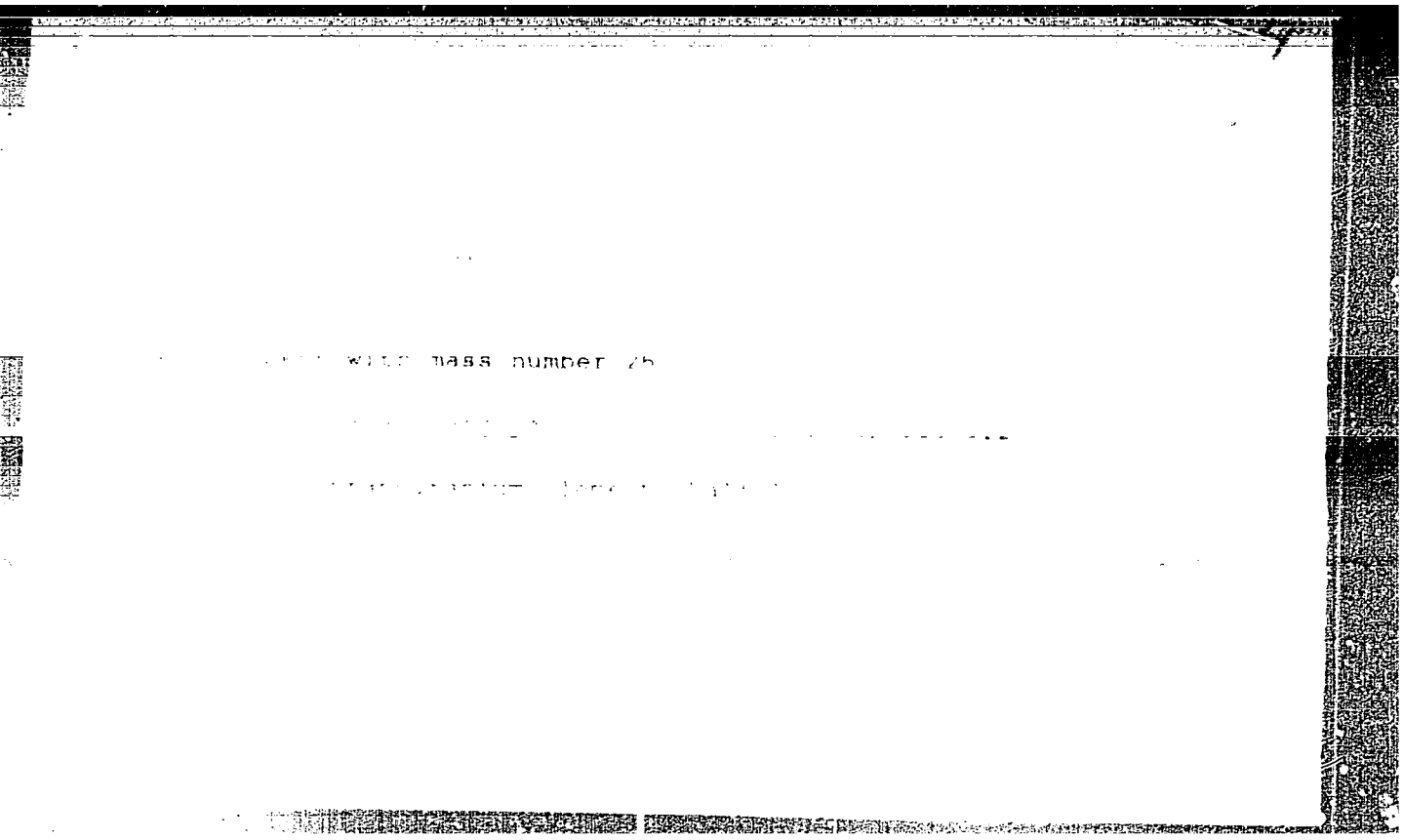
PERIODICAL: Atomnaya energiya, v. 14, no. 1, 1963, 18-26

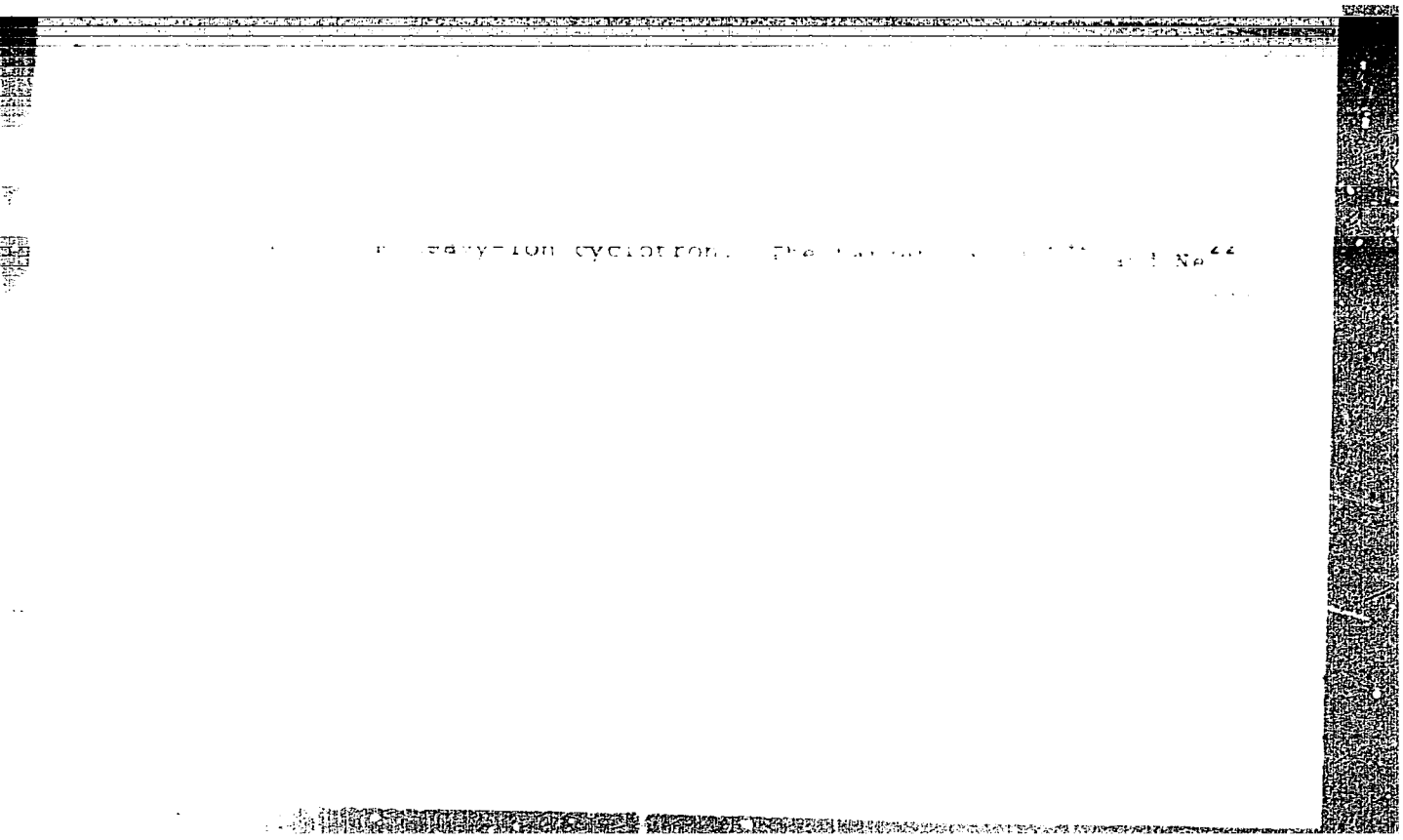
TEXT: Beginning from the first experiment on the spontaneous fission of U^{238} carried out at the Leningradskiy fiziko-tekhnicheskiy institut AN SSSR (Leningrad Physicotechnical Institute AS USSR) in the laboratory of Professor I. V. Kurchatov in cooperation with K. A. Petrzhak and G. N. Flerov, a review is given of the most important results of the fundamental investigations in the field of spontaneous fission and synthesis of transuranic elements. The known regularities of the spontaneous fission made apparent from the $T_{sf}(Z^2/A)$ and $T_{sf}(N)$ diagrams are discussed in detail. The name of I. V. Kurchatov also is intimately associated with the synthesis of transuranic elements. Not only the first reactor but also the first ion cyclotron and the great heavy-ion

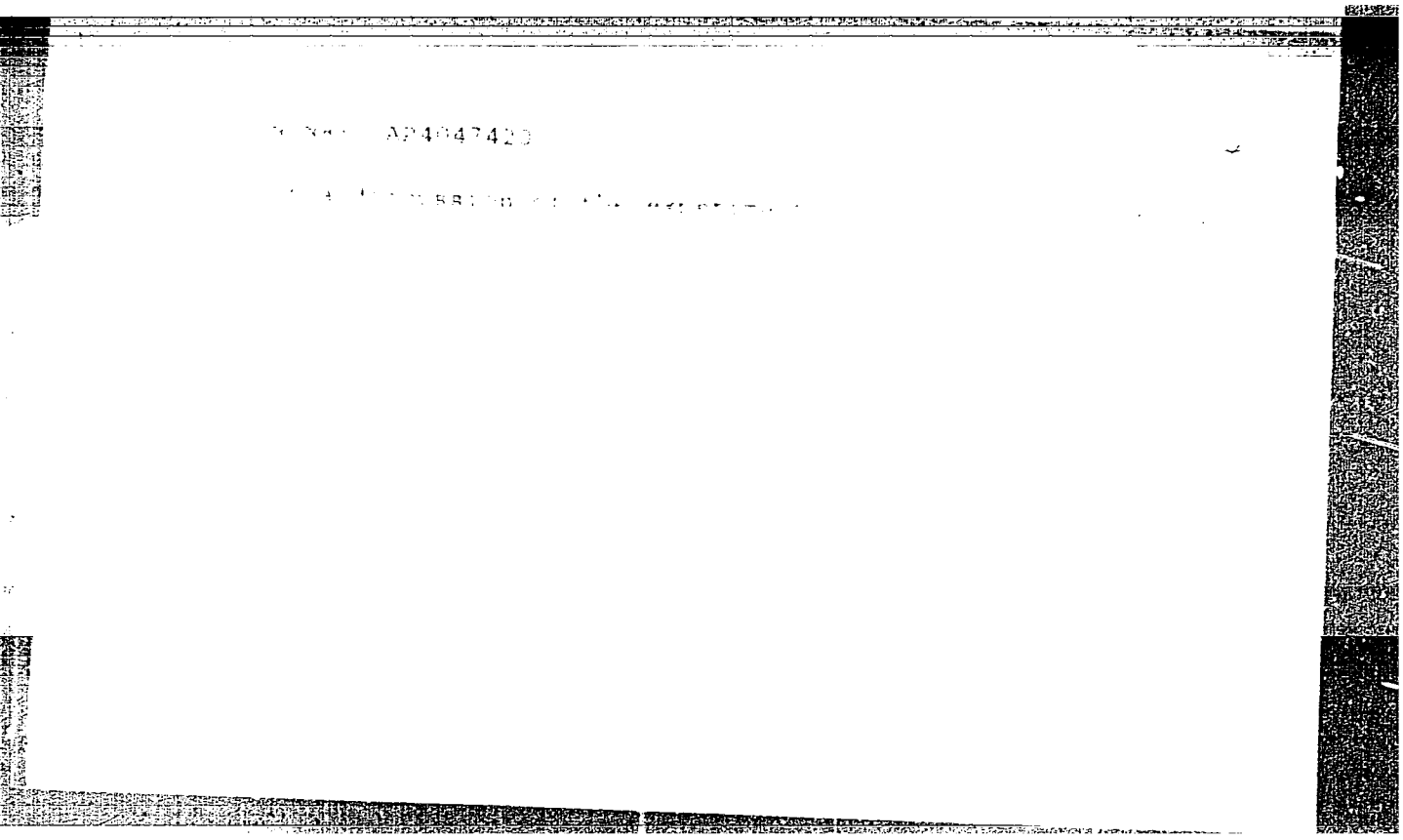
Card 1/2

accelerator in Dubna were built as his suggestion and under his direction. The synthesis of transuranium elements by the bombardment of uranium with multiply charged ions is considered in full detail and the most important methods and results are discussed. The nucleon evaporation resulting from the use of fission products as the bombarding particles is also discussed. The future researches will be devoted, among other questions, to a study of the transuranium isomers, the relationship between the spontaneous fission probability and the nuclear energy levels, and the spontaneous fission of the transfermium isotopes. There are 5 figures.

SUBMITTED: August 30, 1962







FLEROV, G.N.; DRUIN, V.A., kand. fiz.-mat. nauk; OGANESYAN, Yu.Ts., kand. fiz.-mat. nauk; POLIKANOV, S.M., kand. fiz.-mat. nauk; DONETS, Ye.D., nauchn. sotr.; ZVARA, Ivo, nauchn. sotr.; CHERNOV, A.G.; FAYNBOYM, I.B., red.

[Prospects for the synthesis of transuranium elements. Ninth discussion. Participants in the discussion: Flerov, G.N. and others] Perspektivy sinteza transuranovykh elementov. V besede uchastvuiut: G.N.Flerov i dr. Moskva, Znanie, 1965. 39 p. (Novoe v zhizni, nauke, tekhnike. IX Seriia: Fizika, matematika, astronomiia, no.10)
(MIRA 18:5)